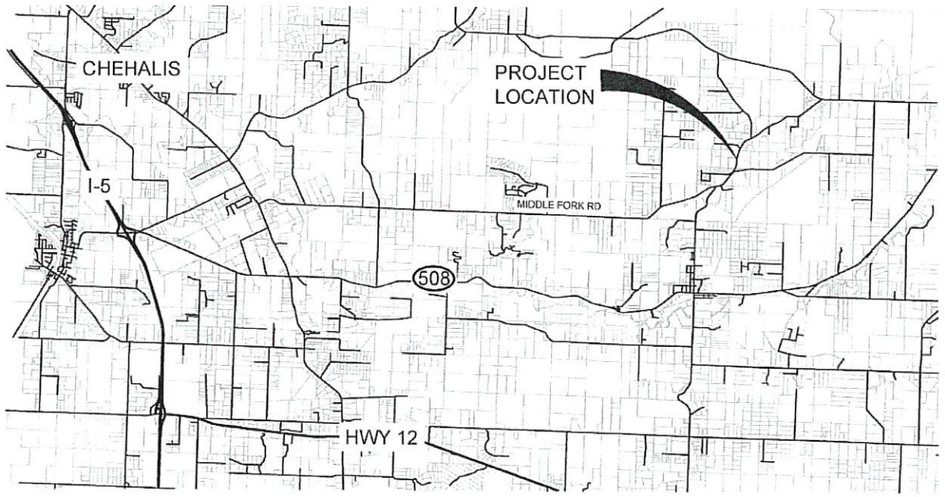
N½, SEC. 20, T13N, R1E

MIDDLE FORK RD MP 7.07 (MIDDLE FORK NEWAUKUM RIVER) CULVERT REPLACEMENT

CMP 1802
LEWIS COUNTY PUBLIC WORKS

AS-BUILT



SITE VICINITY MAP
SCALE: 1" = 1 Mile (@ 22X34)

CONTACT INFORMATION:

OWNER
LEWIS COUNTY PUBLIC WORKS
2025 NE KRESKY AVE
CHEHALIS, WA 98532
PHONE: (360) 740-1123
WWW.LEWISCOUNTYWA.GOV

CONTACT:
ANN WECKBACK
ENVIRONMENTAL PLANNER
E-MAIL: ANN.WECKBACK@LEWISCOUNTYWA.GOV

CIVIL ENGINEER:
PBS ENGINEERING + ENVIRONMENTAL
1180 NW MAPLE STREET, SUITE 160 ISSAQUAH, WA 98027
PHONE: (425) 654-8775
FAX: (866) 727-0140

DAVE SEGAL, PE
PROJECT MANAGER
E-MAIL: DAVE.SEGAL@PBSUSA.COM

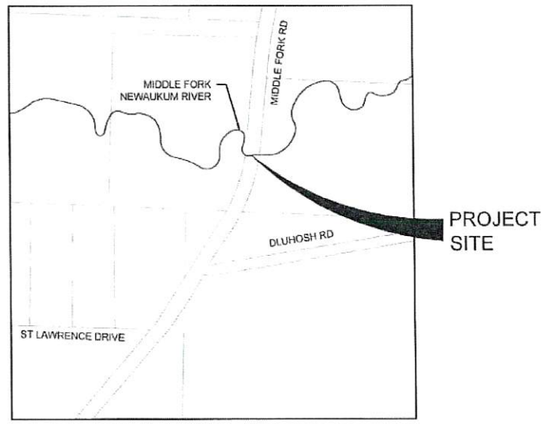
SURVEY CONTROL:
HORIZONTAL DATUM: WASHINGTON STATE PLANE COORDINATE SYSTEM - SOUTH ZONE, NAD 1983/91, RTK METHOD

VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD-88)

BASIS OF BEARING: WASHINGTON STATE PLANE COORDINATE SYSTEM - SOUTH ZONE, NAD 1983/91

COMMISSIONERS:

EDNA FUND, DISTRICT 1
ROBERT C. JACKSON, DISTRICT 2
GARY STAMPER, DISTRICT 3



SITE LOCATION MAP
SCALE: 1" = 300' (@ 22X34)

Sheet Index

SHT #	Category #	Sheet Title
1	G01	COVER SHEET
2	G02	LEGEND
3	EC01	APE AND STAGING AREA PLAN
4	EC02	TESC AND DEWATERING PLAN
5	C01	STREAM AND STRUCTURE PLAN AND PROFILE
6	C02	ROADWAY PLAN AND PROFILE
7	C03	ROADWAY PLAN AND PROFILE
8	C04	ROADWAY TYPICAL SECTIONS
9	C05	ROADWAY SECTIONS
10	D01	DETAILS
11	D02	DETAILS
12	P01	PLANTING PLAN
13	P02	PLANTING NOTES
14	P03	PLANTING DETAILS

LEWIS COUNTY
DEPARTMENT OF PUBLIC WORKS
APPROVED FOR CONSTRUCTION:
Assistant County Engineer — Date 2-11-19

CONSTRUCTION PLANS

PBS Engineering and Environmental Inc.
1180 NW Maple St. Ste 160
Issaquah, WA 98027
425.654.8775
pbsusa.com

PBS

LEGEND
MIDDLE FORK RD MP 7.07 (MIDDLE FORK NEWAUKUM RIVER) CULVERT REPLACEMENT
CMP 1802

811 Know what's below. Call before you dig.

DAVID A. SEGAL — STATE OF WASHINGTON — 22810 — REGISTERED PROFESSIONAL ENGINEER — 2/11/19

DESIGNED: TLF
CHECKED: DAS
February 2019
45013.000

SHEET ID
G01
SHEET 1 OF 14

Filename: L:\Projects\45000\45013\45013-000\0004_Middle Fork Newaukum\Civil\C4D\Working\Sheets\45013.000-G01-G02.dwg Layout Tab: COVER SHEET User: Doug Ehrebracht CAD Plot Date/Time: 2/1/2019 3:48:59 PM

Full Size Sheet Format Is 22x34, If Printed Size is Not 22x34, Then This Sheet Format Has Been Modified & Indicated Drawing Scale Is Not Accurate

Existing Linetype Legend	
Existing Right-of-way	
Existing Edge of Pavement	
Existing Centerline	
Existing Building	
Existing Grade Break	
Existing Edge of Shoulder	
Existing Fence	
Existing Wall	
Existing Lot Line	
Existing Contour	253
Existing Telephone Line	T T
Existing Overhead Power	OHP
Existing Wetland Boundary	
Existing Ordinary High Water	OHW OHW

Proposed/Future Linetype Legend	
Proposed Lot Line	
Proposed Flow Line	
Proposed Centerline	
Proposed Right-of-way	
Proposed Sawcut Line	
Proposed Edge of Shoulder	
Proposed Edge Of Pavement	
Proposed Paint Stripe	
Proposed Lath with Rag Tape	X X X
Proposed Contour	253
Proposed Cut Limit	C C C
Proposed Fill Limit	F F F
Proposed Clear and Grub Limit	
Proposed High Visibility Silt Fence	
Area of Potential Effect	
Wattles	

Symbol Legend			
Existing Power Pole	PP	Proposed Flow Arrow	
Existing Power Meter	PM	Proposed Bypass Culvert Pipe	
Existing Guy Anchor			
Existing Project Bench Mark			
Existing Fence Post			
Existing Sign			
Existing Shrub			
Existing Deciduous Tree			
Existing Coniferous Tree			
Existing Fruit Tree			
Existing Flow Arrow			

Abbreviation Legend			
Acres	AC	Invert Elevation	IE
Catch Basin	CB	Maximum	MAX
Cubic Feet	CF	Minimum	MIN
Centerline	℄	Number	No. or #
Compaction	COMP	Ordinary High Water	OHW
Concrete	CONC	Overhead Power	OHP
Construction	CONST	Point Of Curve	PC
Cubic Yard	CY	Point Of Tangent	PT
Diameter	DIA	Point Of Vertical Intersection	PVI
Edge Of Pavement	EOP	Right Of Way	ROW
Elevation	EL	Sheet	SHT
Existing	EXIST	Station	STA
Finished Grade	FG	Standard	STD
Foot / Feet	FT	Storm	STM
		Telephone	TEL
		Temporary	TEMP
		Typical	TYP

Hatching Legend
Proposed Hot Mixed Asphalt
Proposed Bypass Road
Proposed Construction Entrance
Proposed Bank Protection
Existing Wetland

PBS Engineering and Environmental Inc.
1180 NW Maple St. Ste 160
Issaquah, WA 98027
425.654.8775
pbsusa.com

PBS

LEGEND

MIDDLE FORK RD MP 7.07 MIDDLE FORK RIVER CULVERT REPLACEMENT

SOUTH OF CENTRALIA ALPHA RD ON MIDDLE FORK RD

Know what's below. Call before you dig.

DAVID A. SWANSON — STATE OF WASHINGTON — 23913 — REGISTERED PROFESSIONAL ENGINEER — 1/18/19

DESIGNED: TLF
CHECKED: DAS
JANUARY 2019
45013.000

SHEET ID
G02

SHEET 2 OF 14

CONSTRUCTION PLANS

Full Size Sheet Format Is 22x34; If Printed Size Is Not 22x34, Then This Sheet Format Has Been Modified & Indicated Drawing Scale Is Not Accurate.

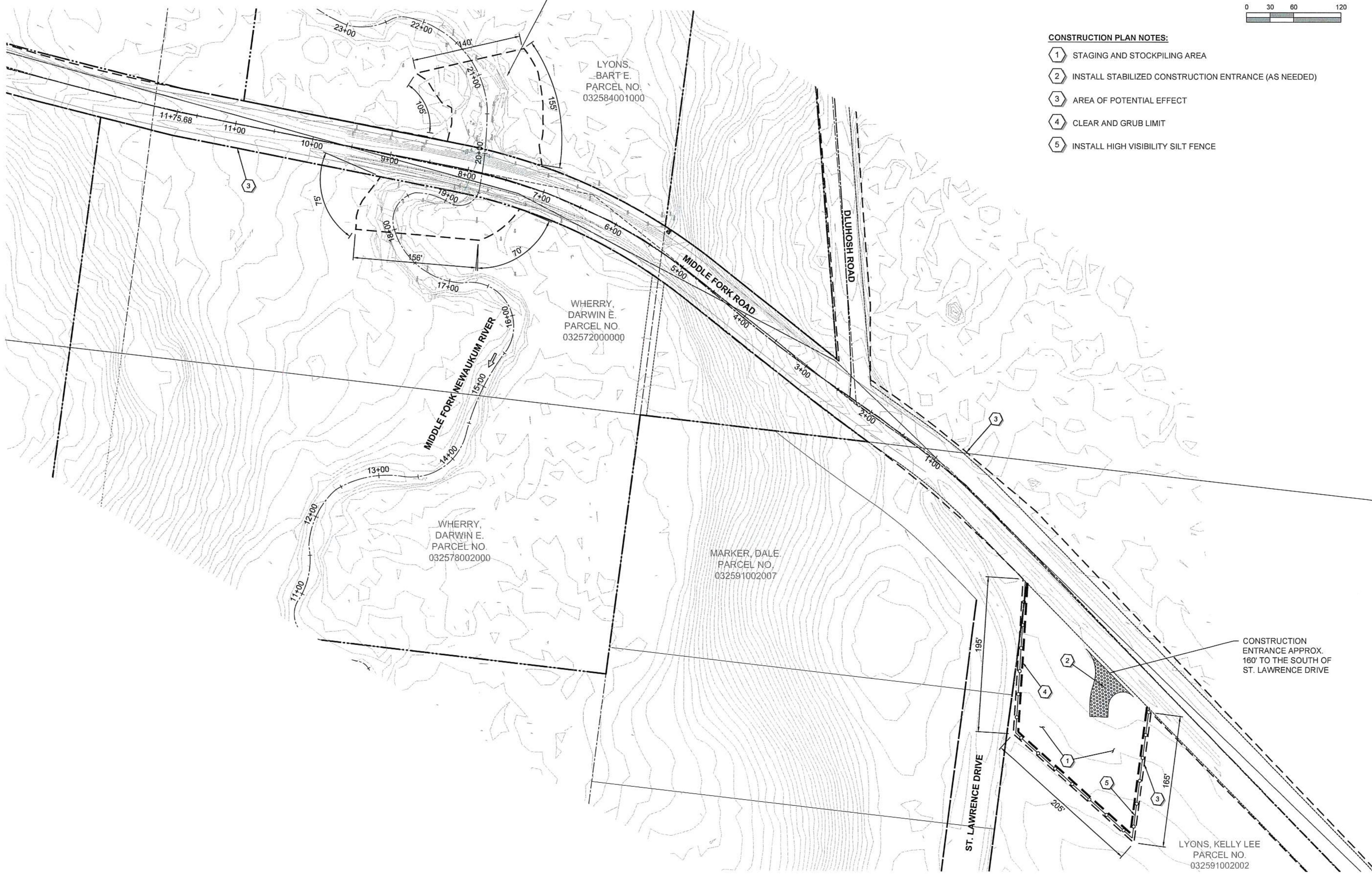
Filename: L:\Projects\45000\45013\45013.000\000\04_Middle Fork Newaukum\Civil\CADWorking\Sheets\45013.000-G01-G02.dwg Layout Tab: LEGEND User: Taylor Ford CAD Plot Date/Time: 1/18/2019 2:09:49 PM

SEE DWG EC02
FOR EROSION CONTROL
INFORMATION

Scale 1" = 60'
0 30 60 120

CONSTRUCTION PLAN NOTES:

1. STAGING AND STOCKPILING AREA
2. INSTALL STABILIZED CONSTRUCTION ENTRANCE (AS NEEDED)
3. AREA OF POTENTIAL EFFECT
4. CLEAR AND GRUB LIMIT
5. INSTALL HIGH VISIBILITY SILT FENCE



CONSTRUCTION PLANS

PBS Engineering and Environmental Inc.
1180 NW Maple St, Ste 160
Issaquah, WA 98027
425.654.8775
pbsusa.com

APE AND STAGING AREA PLAN

MIDDLE FORK RD MP 7.07 MIDDLE FORK RIVER CULVERT REPLACEMENT

SOUTH OF CENTRALIA ALPHA RD ON MIDDLE FORK RD

811 Know what's below. Call before you dig.

DAVID A. SEGAL STATE OF WASHINGTON REGISTERED PROFESSIONAL ENGINEER 39913
1/18/19

DESIGNED: TLF
CHECKED: DAS
JANUARY 2019
45013.000

SHEET ID
EC01

Filename: L:\Projects\45000\45013\45013-000\0004_Middle Fork Newaukum\Civil\CAD\Working\Sheets\45013.000-EC01.dwg Layout Tab: APE PLAN User: Taylor Ford CAD Plot Date/Time: 1/18/2019 2:10:02 PM

CONSTRUCTION PLAN NOTES:

1. INSTALL COFFERDAM AS STAKED IN THE FIELD BY THE ENGINEER
2. ~~INSTALL SPILL CONTAINED PUMP SYSTEM~~ WITH WDFW APPROVED PUMP SCREENS AT INLET AND OUTLET
3. SAWCUT AND REMOVE HMA
4. REMOVE EXISTING 60-INCH CMP CULVERT
5. CLEAR AND GRUB LIMIT
6. INSTALL 4' x 1-½" x ½" LATH WITH RAG TAPE, 10' O.C. (BY LEWIS COUNTY)
7. INSTALL WDFW APPROVED FISH EXCLUSION SCREEN AT 45° ANGLE TO CHANNEL
8. EXCAVATE TO SUBGRADE FOR PROPOSED BOX CULVERT AND WALL FOUNDATION
9. REMOVE/PROTECT EXISTING SIGN
10. INSTALL HIGH VISIBILITY SILT FENCE
11. TREES TO BE PROTECTED
12. AREA OF POTENTIAL EFFECT
13. BYPASS PUMP LINE (APPROXIMATE LOCATION SHOWN - ADJUST TO SUIT CONSTRUCTION SEQUENCING)
14. INSTALL 10' ECO MAT OR APPROVED EQUAL FOR TEMPORARY WETLAND ACCESS PATH
15. STRUCTURE EXCAVATION NEAT LINE
16. TREES TO BE REMOVED
17. UTILITIES TO BE RELOCATED
18. WETLAND BOUNDARY
19. STRAW WATTLES

(2) Installed Gravity Feed Pump System

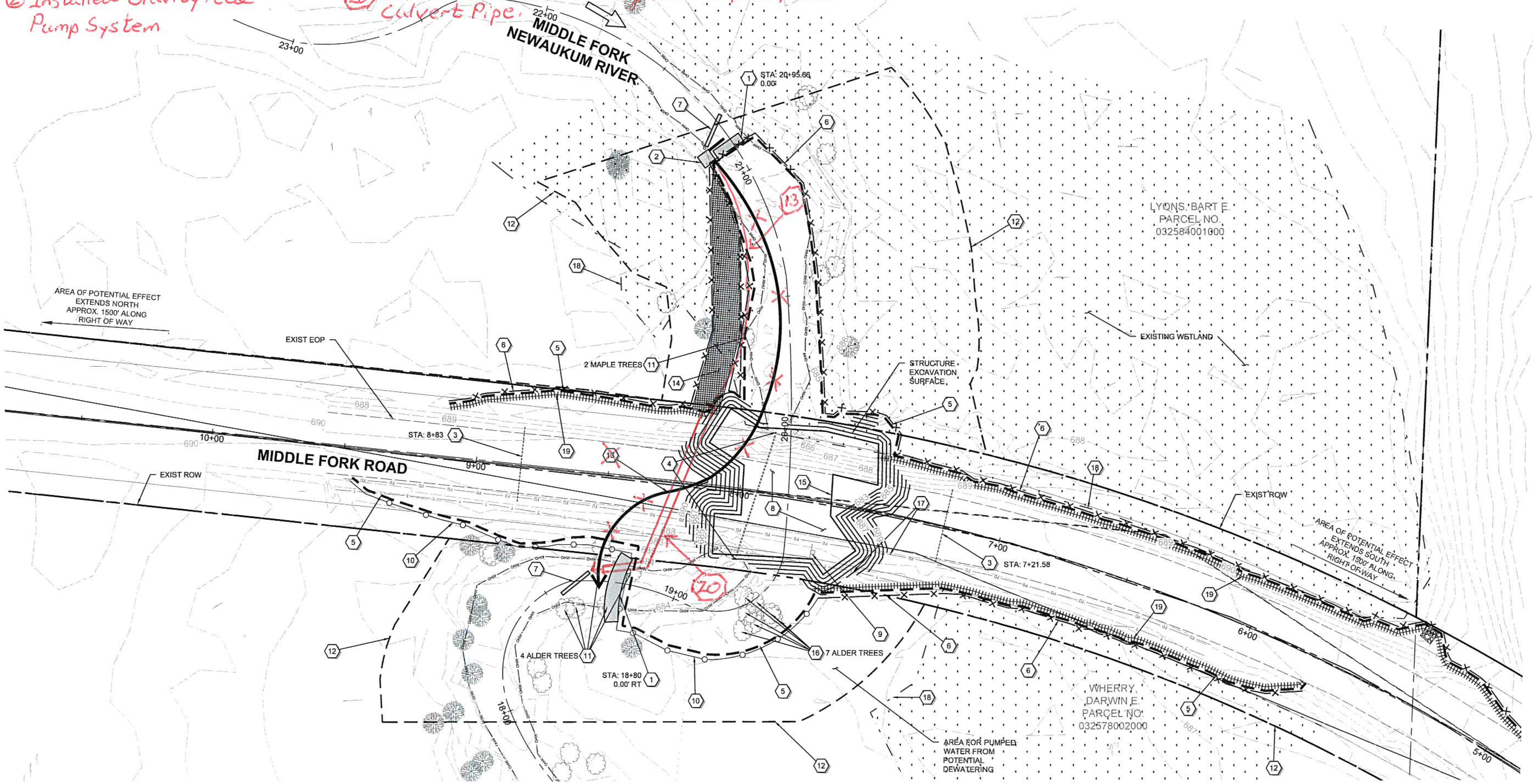
(20) 80 Lf 24 In. Dia. Corrugated Polyethylene Culvert Pipe.

GENERAL NOTES:

1. SEE DWG EC01 FOR STAGING AREA AND APE LIMITS.
2. FOR ECO MAT INSTALLATION, MINOR TRIMMING OR MOWING CAN OCCUR BUT NO ROOT OR GROUND DISTURBANCE.
3. MIDDLE FORK ROAD TO BE CLOSED DURING CONSTRUCTION. CONTRACTOR TO SUBMIT DETOUR PLAN PER COORDINATION WITH LEWIS COUNTY PUBLIC WORKS.
4. CONTRACTOR TO PROVIDE BYPASS CAPACITY FOR 25 CFS USING EITHER GRAVITY OR PUMP SYSTEM.

Scale 1" = 20'

0 10 20 40



Filename: L:\Projects\45000\45013\45013-000\0004_Middle Fork Newaukum\Civil\CAD\Working\Sheets\45013.000-EC01.dwg Layout Tab: TESC PLAN User: Taylor Ford CAD Plot Date/Time: 1/18/2019 2:10:05 PM

Full Size Sheet Format Is 22x34; If Printed Size Is Not 22x34, Then This Sheet Format Has Been Modified & Indicated Drawing Scale Is Not Accurate.

CONSTRUCTION PLANS

PBS Engineering and Environmental Inc.
1180 NW Maple St, Ste 160
Issaquah, WA 98027
425.654.8775
pbsusa.com

TESC AND DEWATERING PLAN

MIDDLE FORK RD MP 7.07 MIDDLE FORK RIVER CULVERT REPLACEMENT

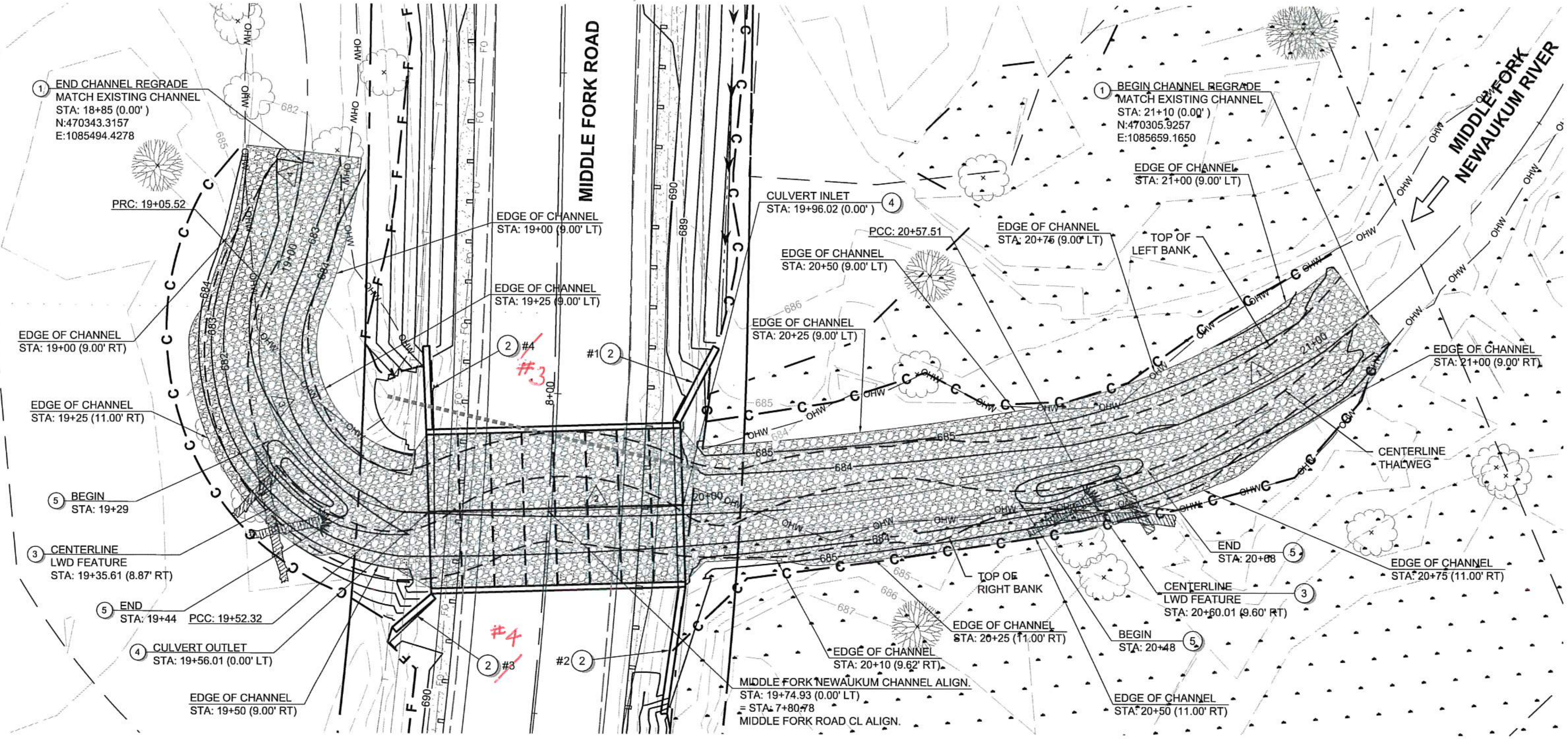
SOUTH OF CENTRALIA ALPHA RD ON MIDDLE FORK RD

811 Know what's below. Call before you dig.

DAVID A. SEGAL, STATE OF WASHINGTON, REGISTERED PROFESSIONAL ENGINEER, 38913 — 1/19/19

DESIGNED: TLF
CHECKED: DAS
JANUARY 2019
45013.000

SHEET ID
EC02



Scale 1" = 10'

0 5 10 20

CONSTRUCTION PLAN NOTES:

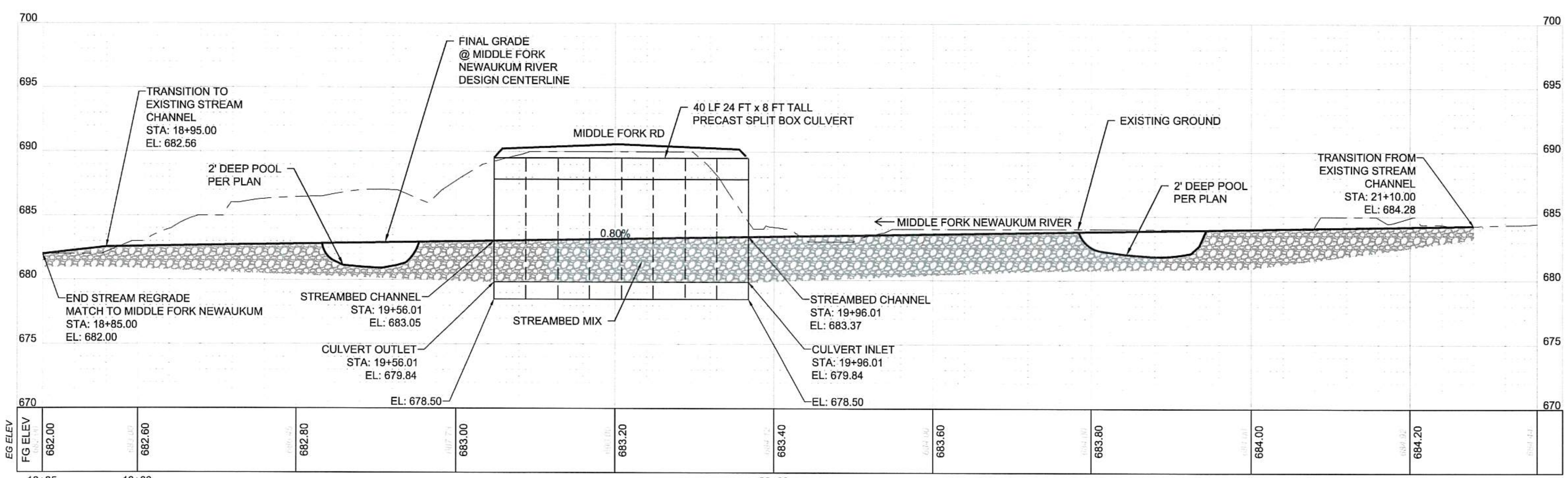
1. RECONSTRUCT STREAM CHANNEL PER DETAIL, SEE DWG D02
2. INSTALL PRECAST CONCRETE WINGWALL PER DETAIL, SEE DWG D01
3. INSTALL LARGE WOODY DEBRIS FEATURES PER DETAIL, SEE DWG D02
4. INSTALL 40 LF 24-FT x 8-FT SPLIT BOX CULVERT. PER DETAIL, SEE DWG D01
5. VARY TYP. CHANNEL SECTION PER DWG D02 TO CONSTRUCT 2-FT DEEP POOL BELOW CHANNEL FINAL GRADE LINE

GENERAL NOTES:

1. THALWEG AND WOODY DEBRIS ARE TO BE PLACED AS SHOWN ON PLANS AS DIRECTED BY THE ENGINEER.
2. LWD STRUCTURE LOCATION IS MEASURED FROM CENTER OF KEY LOG TO STREAM CENTERLINE. SEE DWG D02 FOR MORE DETAILS.
3. SEE DWG D02 FOR ADDITIONAL INFORMATION REGARDING BANK AND CENTERLINE THALWEG LOCATIONS.

CENTERLINE CURVE DATA

#	Δ	R	L	T
1	75°37'10"	125.83	166.08	97.64
2	10°44'45"	560.84	105.19	52.75
3	103°24'11"	25.93	46.80	32.84
4	31°58'45"	81.61	45.55	23.39



SCALE
H: 1" = 10'
V: 1" = 5'

Full Size Sheet Format Is 22x34; If Printed Size Is Not 22x34, Then This Sheet Format Has Been Modified & Indicated Drawing Scale Is Not Accurate.

Filename: L:\Projects\45000\45013\45013-000\0004_Middle Fork Newaukum\Civil\CAD\Working\Sheets\45013.000-C01-C02.dwg Layout Tab: STREAM P AND P User: Taylor Ford CAD Plot Date/Time: 1/18/2019 2:10:36 PM

CONSTRUCTION PLANS

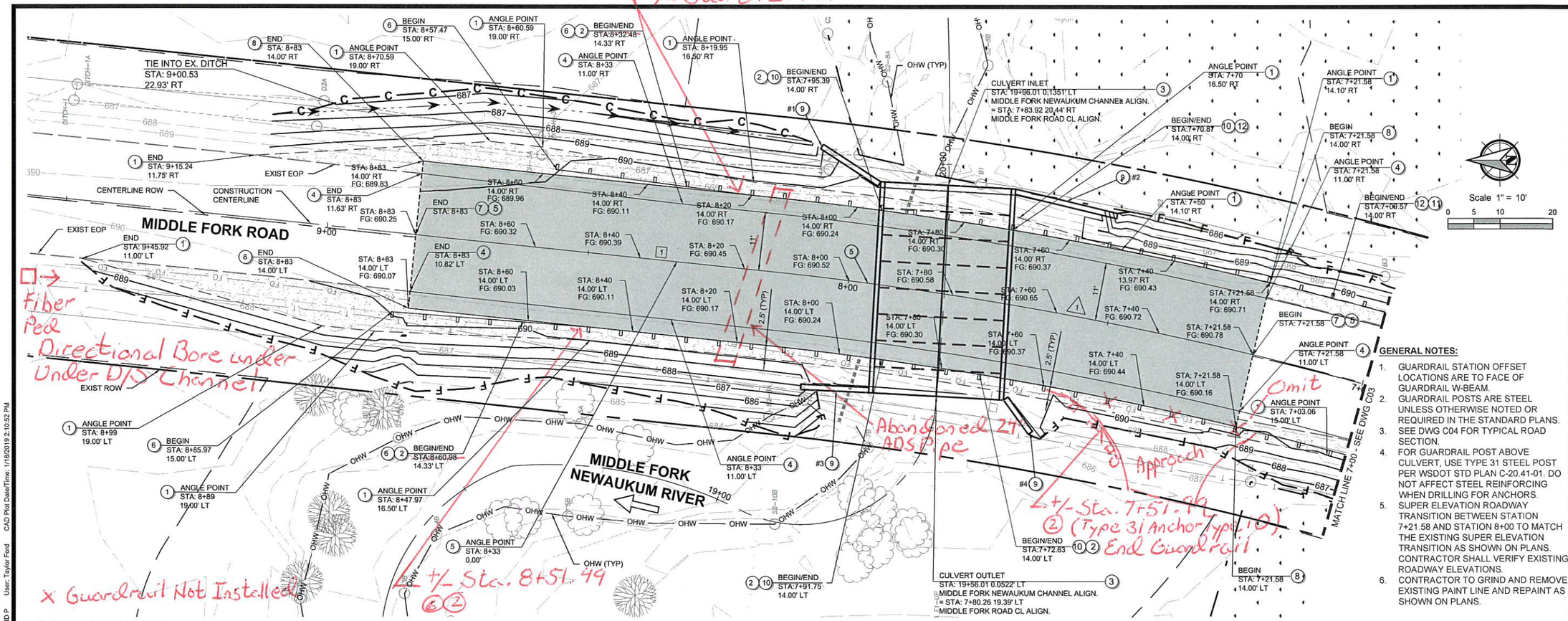
STREAM AND STRUCTURE PLAN AND PROFILE
MIDDLE FORK RD MP 7.07 MIDDLE FORK RIVER CULVERT REPLACEMENT
SOUTH OF CENTRALIA ALPHA RD ON MIDDLE FORK RD

PBS
PBS Engineering and Environmental Inc.
1180 NW Maple St, Ste 160
Issaquah, WA 98027
425.654.8775
pbsusa.com

Know what's below. Call before you dig.

DAVID A. SHAW STATE OF WASHINGTON REGISTERED PROFESSIONAL ENGINEER 39913
1/18/19

DESIGNED: TLF
CHECKED: DAS
JANUARY 2019
45013.000
SHEET ID
C01
SHEET 5 OF 14



CONSTRUCTION PLAN NOTES:

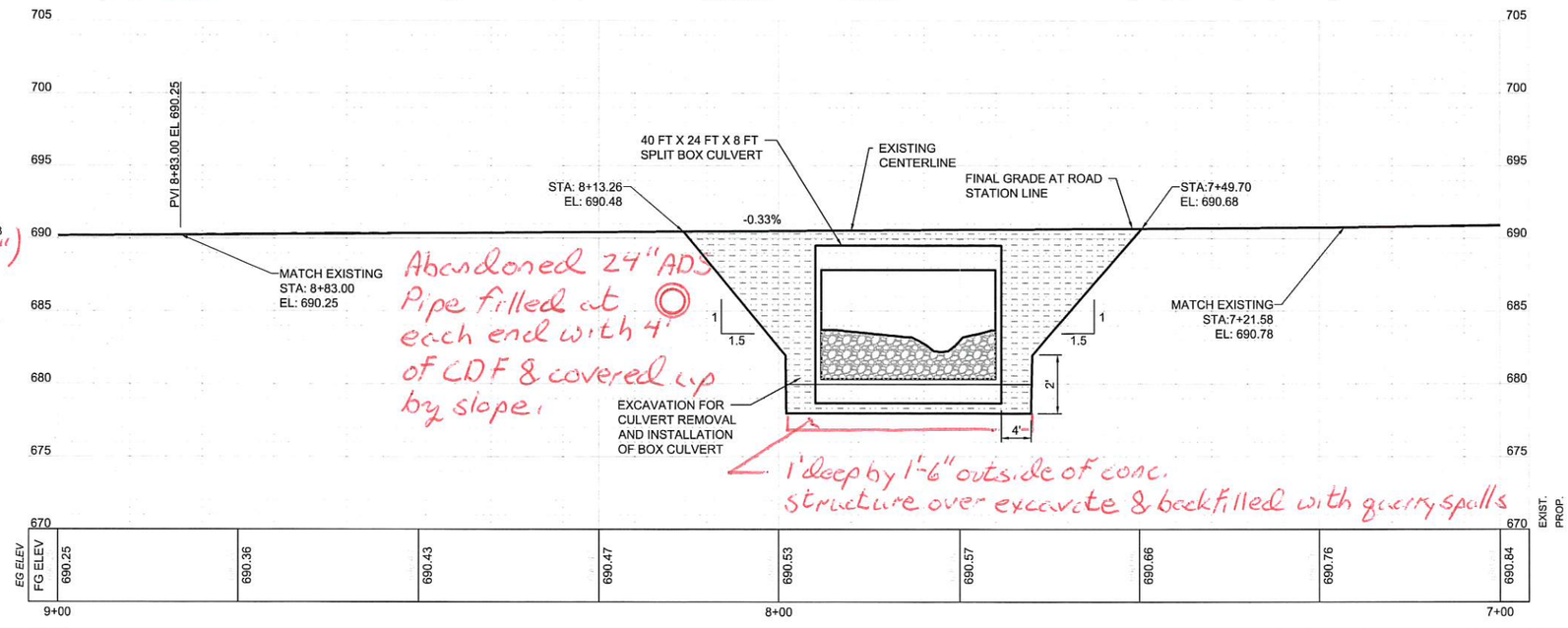
1. SHOULDER WIDENING
2. BEAM GUARDRAIL TYPE 31, PER WSDOT STD PLAN C-20.10-04 WITH 6' POSTS
3. 40-LF PRECAST SPLIT BOX CULVERT PER DETAIL, SEE DWG D01
4. WHITE PAINT LINE (GRIND AND REMOVE BEFORE REPLACING)
5. DOUBLE CENTER YELLOW PAINT LINE (GRIND AND REMOVE BEFORE REPLACING)
6. BEAM GUARDRAIL TYPE 31 MSKT-SP-MGS (TL-2) NON-FLARED TERMINAL PER WSDOT STD PLAN C-22.45-03 WITH 6' POSTS (Length of Term. 34'-4")
7. HMA PAVEMENT (SEE SECTION DETAIL, DWG D01)
8. SAWCUT
9. CONCRETE WINGWALL
10. BOX CULVERT GUARDRAIL STEEL POST TYPE 31, PER WSDOT STD PLAN C-20.41-01
11. BEAM GUARDRAIL TYPE 31, PER WSDOT STD PLAN C-20.10-04 WITH 8' POSTS
12. BEAM GUARDRAIL TYPE 31, PER WSDOT STD PLAN C-20.10-04 WITH 9' POSTS

CENTERLINE LINE DATA

#	Length	Direction
1	128.63	N05° 49' 39.17"E

CENTERLINE CURVE DATA

#	Δ	R	L	T
1	27°01'49"	715.00	345.45	171.86



SCALE
H: 1" = 10'
V: 1" = 5'

GENERAL NOTES:

1. GUARDRAIL STATION OFFSET LOCATIONS ARE TO FACE OF GUARDRAIL W-BEAM.
2. GUARDRAIL POSTS ARE STEEL UNLESS OTHERWISE NOTED OR REQUIRED IN THE STANDARD PLANS.
3. SEE DWG C04 FOR TYPICAL ROAD SECTION.
4. FOR GUARDRAIL POST ABOVE CULVERT, USE TYPE 31 STEEL POST PER WSDOT STD PLAN C-20.41-01. DO NOT AFFECT STEEL REINFORCING WHEN DRILLING FOR ANCHORS.
5. SUPER ELEVATION ROADWAY TRANSITION BETWEEN STATION 7+21.58 AND STATION 8+00 TO MATCH THE EXISTING SUPER ELEVATION TRANSITION AS SHOWN ON PLANS. CONTRACTOR SHALL VERIFY EXISTING ROADWAY ELEVATIONS.
6. CONTRACTOR TO GRIND AND REMOVE EXISTING PAINT LINE AND REPAINT AS SHOWN ON PLANS.

PBS Engineering and Environmental Inc.
1180 NW Maple St, Ste 160
Issaquah, WA 98027
425.654.8775
pbsusa.com

PBS

ROADWAY PLAN AND PROFILE
MIDDLE FORK RD MP 7.07 MIDDLE FORK RIVER CULVERT REPLACEMENT
SOUTH OF CENTRALIA ALPHA RD ON MIDDLE FORK RD

811 Know what's below. Call before you dig.

DAVID A. SIMPSON — STATE OF WASHINGTON — 39913 — REGISTERED PROFESSIONAL ENGINEER — 11/01/19

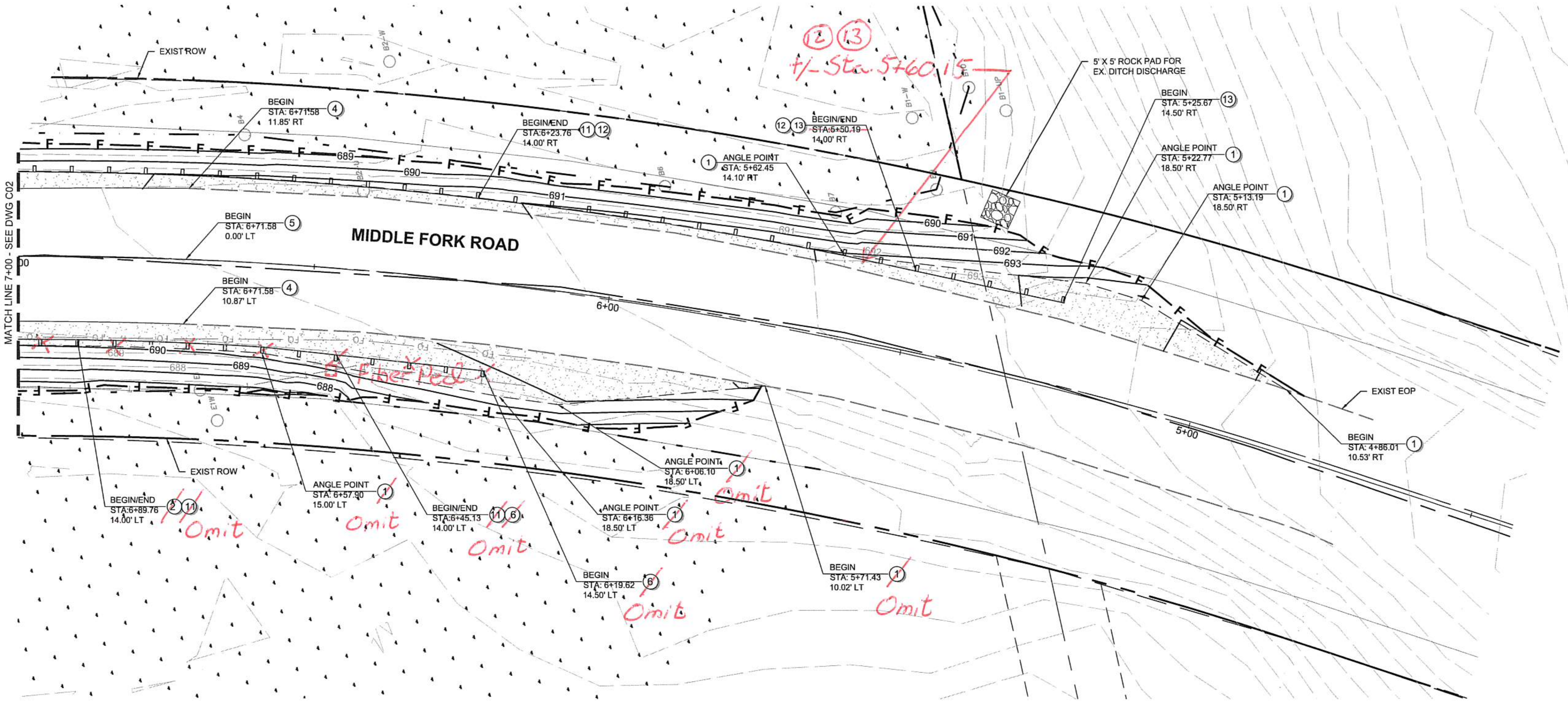
DESIGNED: TLF
CHECKED: DAS
JANUARY 2019
45013.000

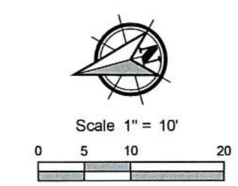
SHEET ID
C02
SHEET 6 OF 14

CONSTRUCTION PLANS

Full Size Sheet Format Is 22x34. If Printed Size Is Not 22x34, Then This Sheet Format Has Been Modified & Indicated Drawing Scale Is Not Accurate.

Filename: L:\Projects\45000\45013\45913-000\0004_Middle Fork Newaukum\Civil\CADWorking\Sheets\45913.000-C03-C04.dwg Layout Tab: ROADWAY P AND P User: Taylor Ford CAD Plot Date/Time: 1/18/2019 2:10:52 PM





x Guardrail Not Installed

CONSTRUCTION PLAN NOTES:

1. SHOULDER WIDENING
2. BEAM GUARDRAIL TYPE 31, PER WSDOT STD PLAN C-20.10-04 WITH 6' POSTS
4. WHITE PAINT LINE (GRIND AND REMOVE BEFORE REPLACING)
5. DOUBLE CENTER YELLOW PAINT LINE (GRIND AND REMOVE BEFORE REPLACING)
6. BEAM GUARDRAIL TYPE 31 MSKT-SP-MGS (TL-2) NON-FLARED TERMINAL PER WSDOT STD PLAN C-22.45-03 WITH 6' POSTS
11. BEAM GUARDRAIL TYPE 31, PER WSDOT STD PLAN C-20.10-04 WITH 8' POSTS
12. BEAM GUARDRAIL TYPE 31, PER WSDOT STD PLAN C-20.10-04 WITH 9' POSTS
13. BEAM GUARDRAIL TYPE 31 MSKT-SP-MGS (TL-2) NON-FLARED TERMINAL PER WSDOT STD PLAN C-22.45-03 WITH ~~8'~~ 6' Post POSTS

(Length of term. 34'-4")

CONSTRUCTION PLANS

PBS Engineering and Environmental Inc.
1180 NW Maple St, Ste 160
Issaquah, WA 98027
425.654.8775
pbsusa.com

ROADWAY PLAN AND PROFILE

MIDDLE FORK RD MP 7.07 MIDDLE FORK RIVER CULVERT REPLACEMENT

SOUTH OF CENTRALIA ALPHA RD ON MIDDLE FORK RD

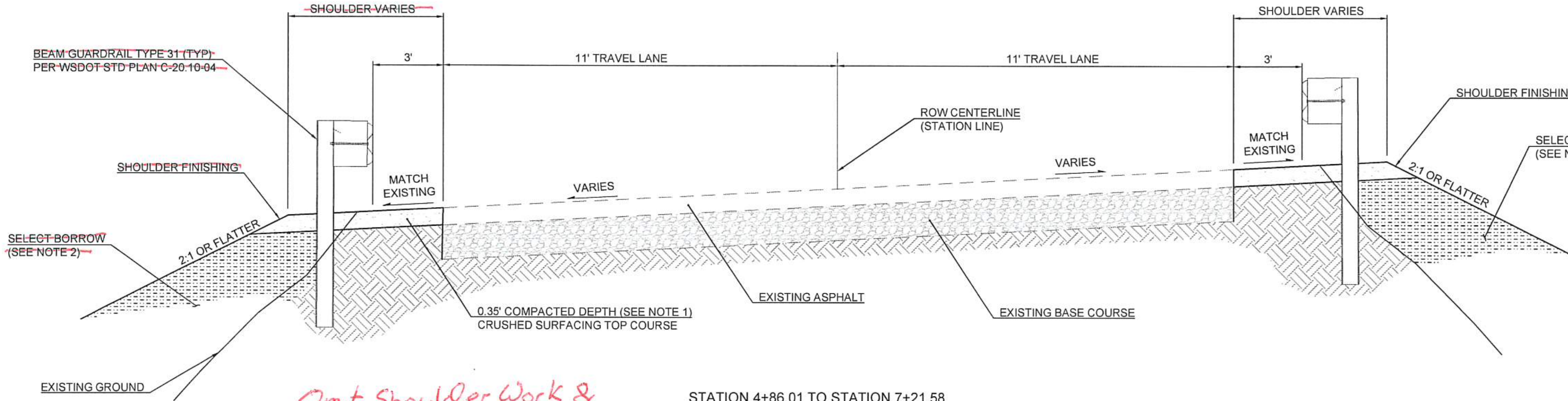
Know what's below. Call before you dig.

DAVID A. SEGAL, STATE OF WASHINGTON, REGISTERED PROFESSIONAL ENGINEER 38913 1/19/19

DESIGNED: TLF
CHECKED: DAS
JANUARY 2019
45013.000

SHEET ID
C03

Filename: L:\Projects\45000\45013\45013-000\0004_Middle Fork Newaukum\Civil\CAD\Working\Sheets\45013.000-C03-C04.dwg Layout Tab: ROADWAY P AND P - 2 User: Taylor Ford CAD Plot Date/Time: 1/18/2019 2:10:56 PM

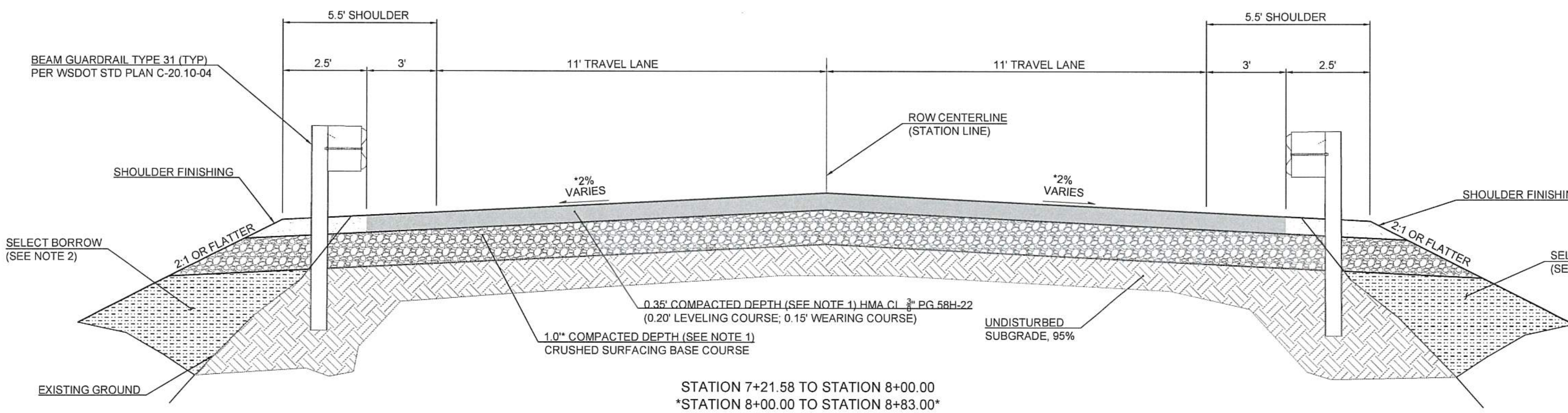


Omit Shoulder Work & Guardrail Sta. 4+86.01 to 7+21.58 L.t.

STATION 4+86.01 TO STATION 7+21.58
STATION 8+83.00 TO STATION 9+28.60

NOTES:

1. APPROXIMATE COMPACTED DEPTH. MATCHING EXISTING, TWO EQUAL LIFTS
2. BENCH INTO EXISTING SIDE SLOPE PER WSDOT STANDARD SPECIFICATION 2-03.3(14).
3. USE POST LENGTHS FOR GUARDRAIL AS SHOWN ON SHEET C02 AND C03.
4. FOR GUARDRAIL POSTS ABOVE CULVERT, USE TYPE 31 STEEL POSTS PER WSDOT STD PLAN C-20.41-01.



STATION 7+21.58 TO STATION 8+00.00
STATION 8+00.00 TO STATION 8+83.00

(1) TYPICAL ROAD RESTORATION SECTION

NOT TO SCALE

Filename: L:\Projects\45000\45013\45013-000\0004_Middle Fork Newaukum\Civil\CAD\Working\Sheets\45013.000-C03-C04.dwg Layout Tab: ROADWAY DETAILS User: Taylor Ford CAD Plot Date/Time: 1/18/2019 2:11:00 PM

PBS
PBS Engineering and Environmental Inc.
1180 NW Maple St, Ste 160
Issaquah, WA 98027
425.654.8775
pbsusa.com

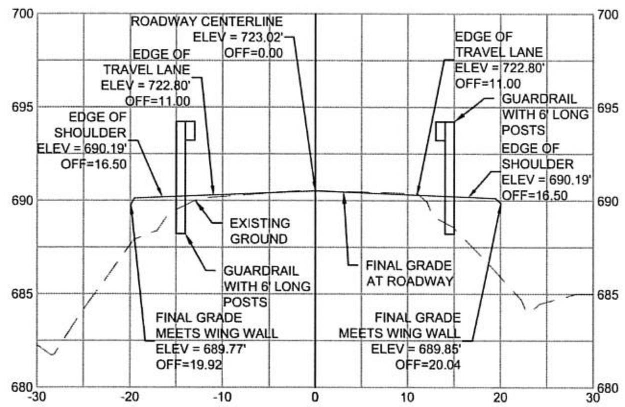
ROADWAY TYPICAL SECTIONS
MIDDLE FORK RD MP 7.07 MIDDLE FORK RIVER CULVERT REPLACEMENT
SOUTH OF CENTRALIA ALPHA RD ON MIDDLE FORK RD

DAVID A. SEGAL, STATE OF WASHINGTON, 39913, REGISTERED PROFESSIONAL ENGINEER 1/18/19

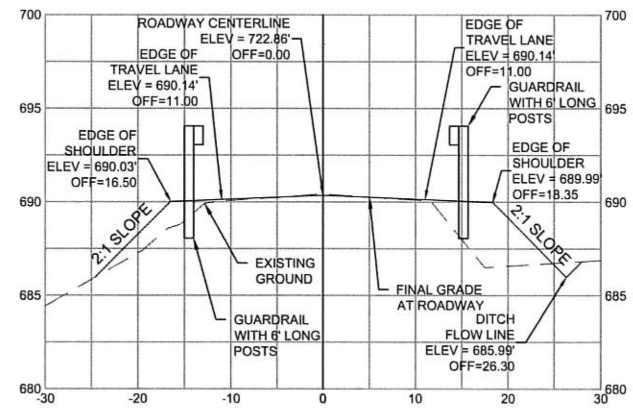
DESIGNED: TLF
CHECKED: DAS
JANUARY 2019
45013.000

SHEET ID
C04

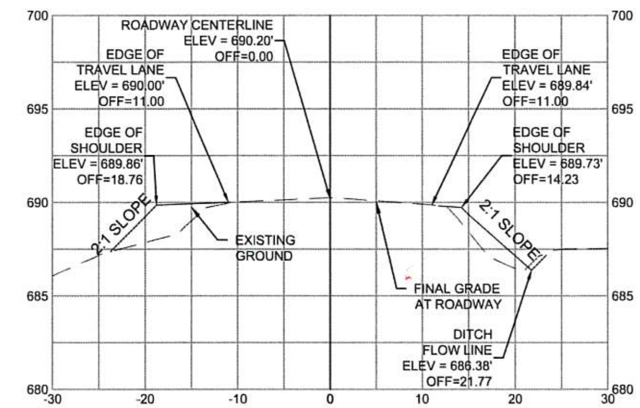
CONSTRUCTION PLANS



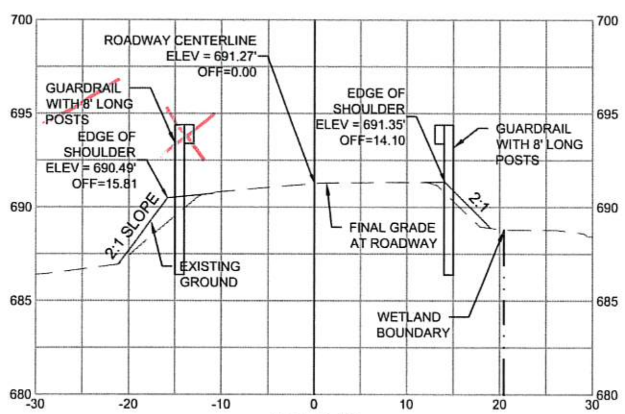
STA: 8+00



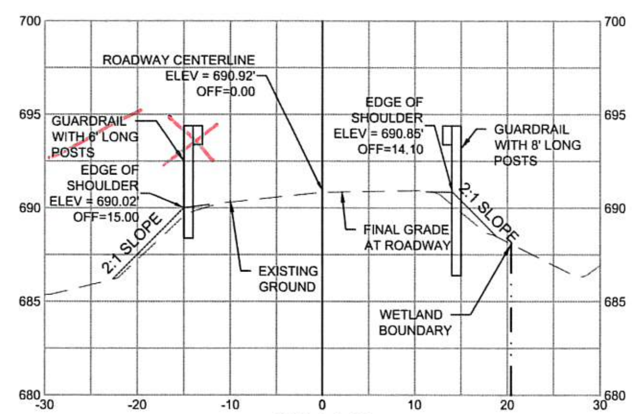
STA: 8+50



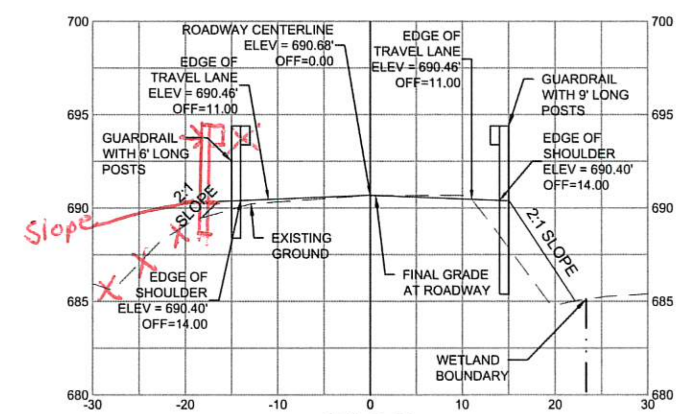
STA: 9+00



STA: 6+50



STA: 7+00



STA: 7+50

Transition Point From a Beam Guardrail Type 31 to a Beam Guardrail Type 31 Anchor Type 10

(2) **ROADWAY CROSS SECTIONS**

ROADWAY SECTIONS

MIDDLE FORK RD MP 7.07 MIDDLE FORK RIVER CULVERT REPLACEMENT

SOUTH OF CENTRALIA ALPHA RD ON MIDDLE FORK RD

PBS

PBS Engineering and Environmental Inc.
1180 NW Maple St, Ste 160
Issaquah, WA 98027
425.654.8775

pbsusa.com

811 Know what's below. Call before you dig.

DAVID A. SEGAL, STATE OF WASHINGTON, REGISTERED PROFESSIONAL ENGINEER 1/19/19

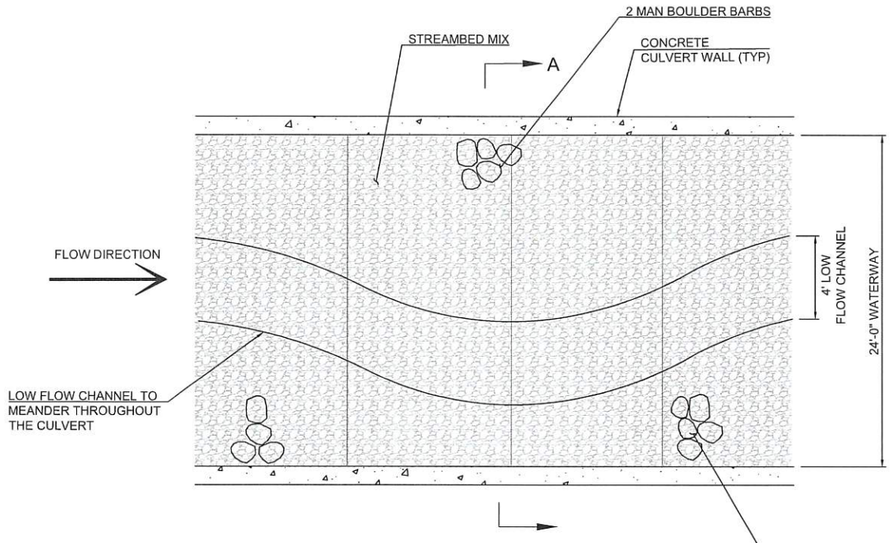
DESIGNED: TLF

CHECKED: DAS

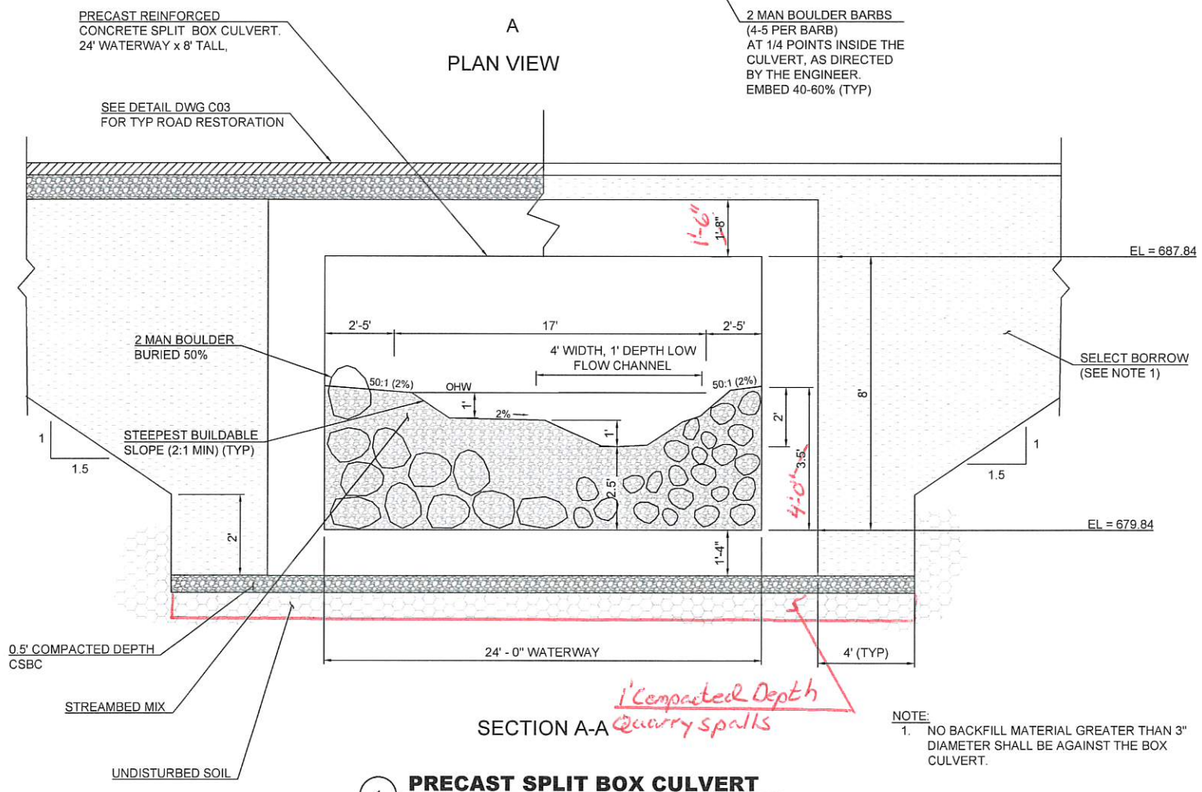
JANUARY 2019
45013.000

SHEET ID
C05

CONSTRUCTION PLANS



PLAN VIEW



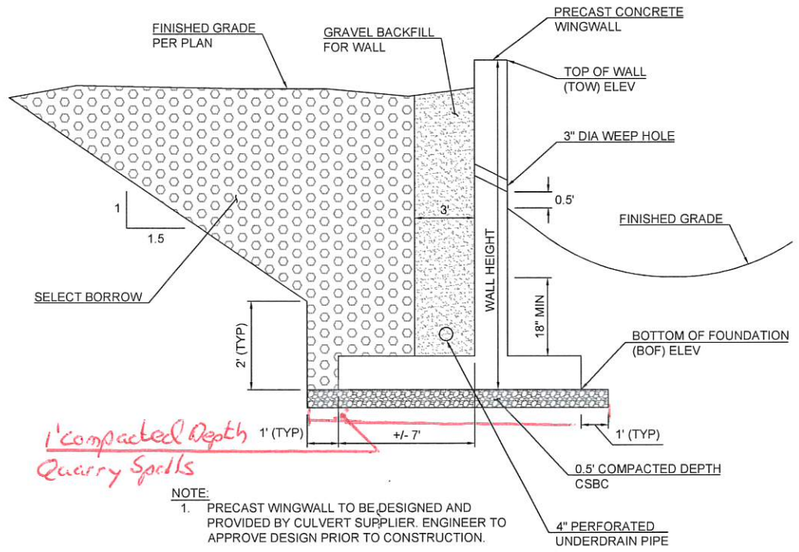
SECTION A-A

NOTE:
1. NO BACKFILL MATERIAL GREATER THAN 3" DIAMETER SHALL BE AGAINST THE BOX CULVERT.

1 PRECAST SPLIT BOX CULVERT
NOT TO SCALE

GENERAL NOTES:

1. LARGE WOODY DEBRIS FEATURES AND THALWEG LOCATIONS ARE TO BE PLACED AS SHOWN ON PLANS. MINOR CHANGES TO THE WOOD FEATURES CAN BE MADE IN THE FIELD BY THE ENGINEER.
2. STREAMBED MIX: ONE PART 12" COBBLES, 1 PART 8" COBBLES, AND ONE PART STREAMBED SEDIMENT. TWO-MAN STREAMBED BOULDERS SHALL BE PLACED AS DIRECTED BY THE ENGINEER.
3. STREAMBED SEDIMENT IS TO PROVIDE STABILITY TO THE STREAMBED MIX AND BE PLACED IN AREA OF VOIDS TO CREATE A UNIFORM, NON-POROUS BED.



NOTE:
1. PRECAST WINGWALL TO BE DESIGNED AND PROVIDED BY CULVERT SUPPLIER. ENGINEER TO APPROVE DESIGN PRIOR TO CONSTRUCTION.

2 PRECAST CONCRETE WINGWALL
NOT TO SCALE

WINGWALL TABLE

WINGWALL NO.	LENGTH (FT)	ANGLE TO CULVERT (DEGREES)	BEGIN HEIGHT (FT)	END HEIGHT (FT)	BOF ELEV
1 (NE)	13	150	11.00	8.50	678.51
2 (SE)	20	170 → 190	11.00	8.50	678.51
3 (NW)	13	180	11.00	10.00	678.51
4 (SW)	8	129	11.00	10.00	678.51

* HEIGHT OF WALL INCLUDES ASSUMED 16" THICK FOOTING

PBS Engineering and Environmental Inc.
1180 NW Maple St. Ste 160
Issaquah, WA 98027
425.654.8775
pbsusa.com

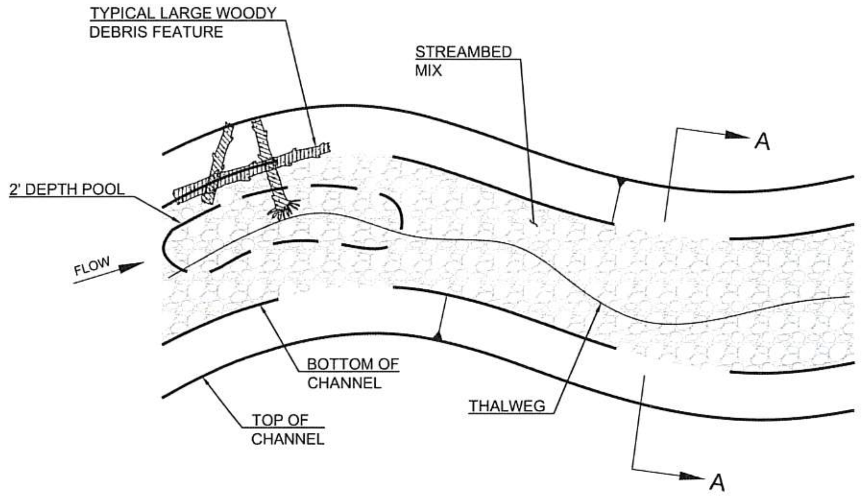
DETAILS
MIDDLE FORK RD MP 7.07 MIDDLE FORK RIVER CULVERT REPLACEMENT
SOUTH OF CENTRALIA ALPHA RD ON MIDDLE FORK RD

Know what's below. Call before you dig.

DAVID A. SIMON — STATE OF WASHINGTON — 25913 — REGISTERED PROFESSIONAL ENGINEER
11/01/19

DESIGNED: TLF
CHECKED: DAS
JANUARY 2019
45013.000
SHEET ID
D01
SHEET 10 OF 14

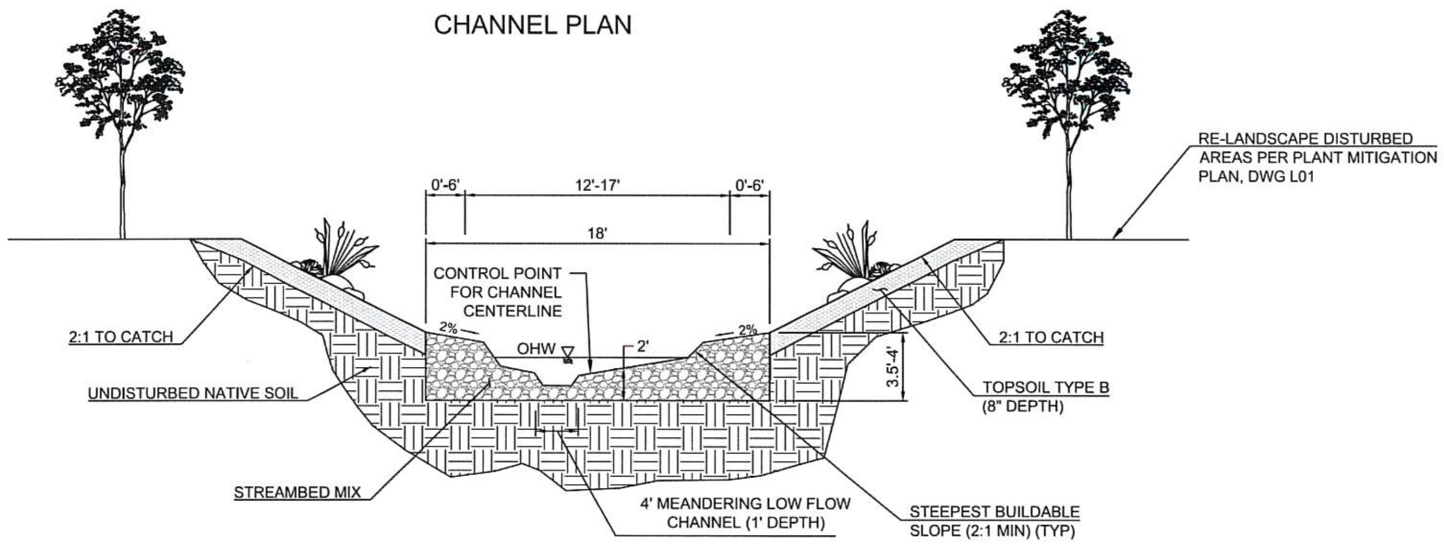
CONSTRUCTION PLANS



CHANNEL PLAN

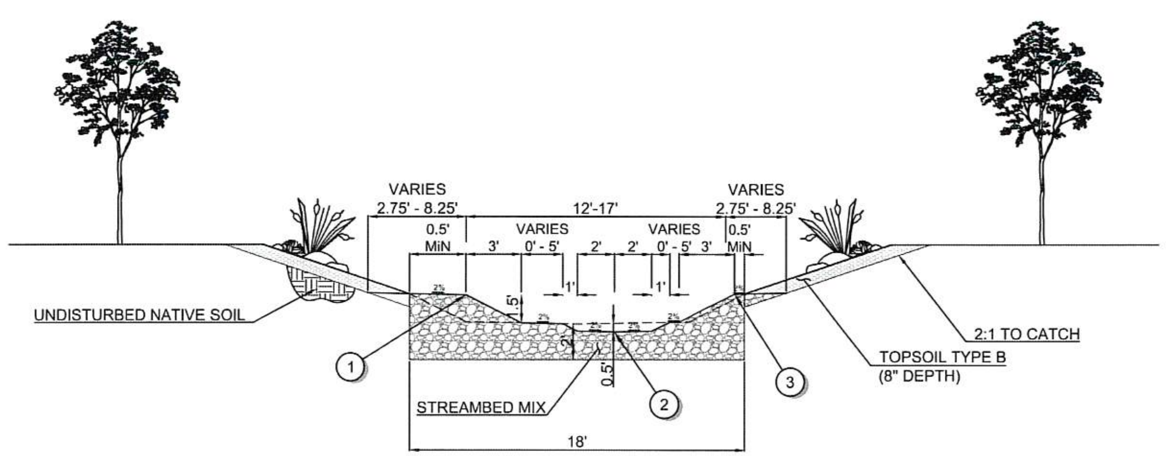
GENERAL NOTES:

1. LARGE WOODY DEBRIS FEATURES AND THALWEG LOCATIONS ARE TO BE PLACED AS SHOWN ON PLANS. MINOR CHANGES TO THE WOOD FEATURES CAN BE MADE IN THE FIELD BY THE ENGINEER.
2. STREAMBED MIX: ONE PART 12" COBBLES, 1 PART 8" COBBLES, AND ONE PART STREAMBED SEDIMENT. TWO-MAN STREAMBED BOULDERS SHALL BE PLACED AS DIRECTED BY THE ENGINEER.
3. STREAMBED SEDIMENT IS TO PROVIDE STABILITY TO THE STREAMBED MIX AND BE PLACED IN AREA OF VOIDS TO CREATE A UNIFORM, NON-POROUS BED.
4. SEE PLANT MITIGATION PLANS ON DWG L01 FOR FINAL STABILIZATION REQUIREMENTS.



CHANNEL SECTION A-A

1 MIDDLE FORK NEWAUKUM CHANNEL
NOT TO SCALE



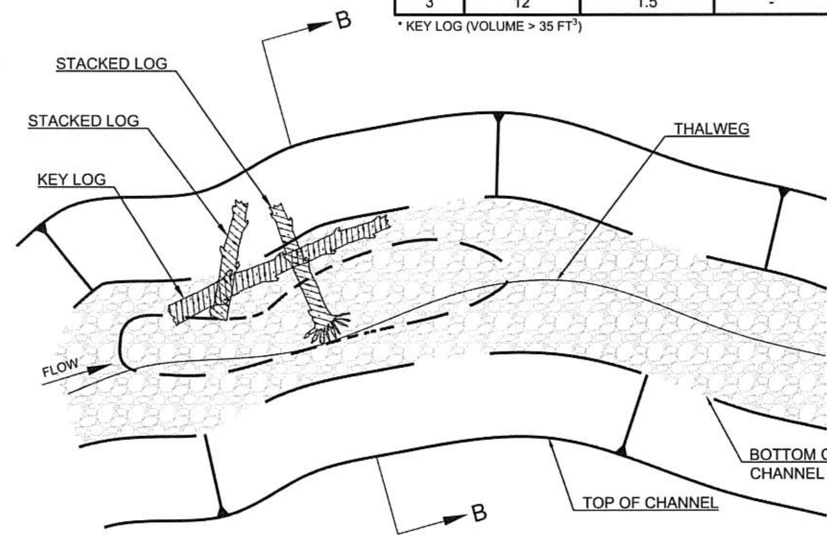
3 BANK LOCATION AND STREAMBED MIX SECTIONS
NOT TO SCALE

LARGE WOODY DEBRIS CONTROL TABLE		
LWD FEATURE STATION	LOGS*	VOLUME (FT^3)
19+36.57	1,2,3	119.0
20+60.11	1,2,3	119.0

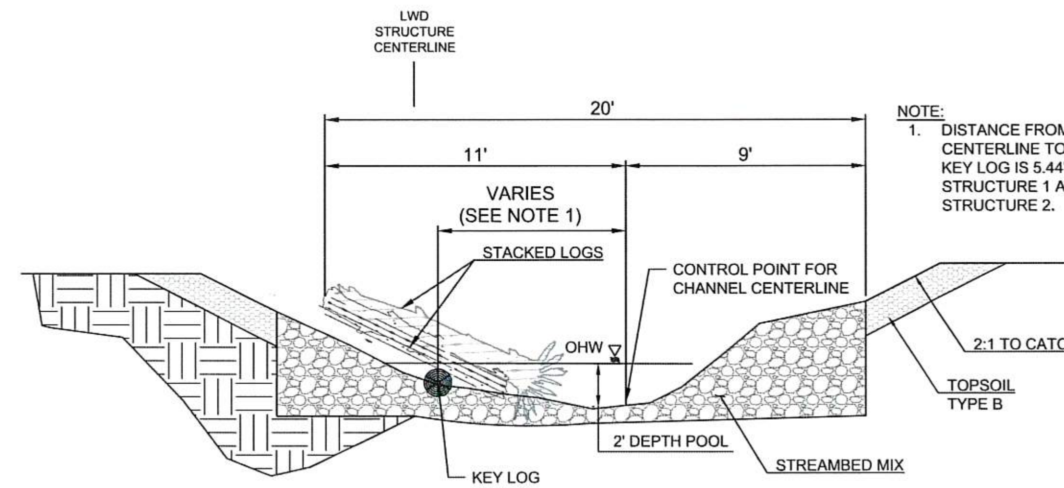
* SEE LOG SCHEDULE TO THE RIGHT

LOG SCHEDULE					
LOG #	LOG LENGTH (FT)	LOG DIAMETER (FT)	ROOTWAD LENGTH (FT)	ROOTWAD DIAMETER (FT)	VOLUME (FT^3)
1*	20	2	-	-	62.8
2	15	1.5	2	3	35.0
3	12	1.5	-	-	21.2

* KEY LOG (VOLUME > 35 FT^3)



TYPICAL LARGE WOODY DEBRIS PLAN



NOTE:
1. DISTANCE FROM STREAM CENTERLINE TO CENTERLINE OF KEY LOG IS 5.44' FOR LWD STRUCTURE 1 AND 5.73' FOR LWD STRUCTURE 2.

TYPICAL LARGE WOODY DEBRIS SECTION B-B

2 TYPICAL LARGE WOODY DEBRIS FEATURE
NOT TO SCALE

STREAMBED MIX FINISHED SURFACE SECTIONS				
STREAM CL STATION (A)	PT #1 (CL TO LEFT TERRACE)	PT #2 (DIST CL TO THALWEG)	PT #3 (DIST CL TO RIGHT TERRACE)	BANK FULL WIDTH
18+85	MATCH EXISTING STREAM	MATCH EXISTING THALWEG	MATCH EXISTING STREAM	MATCH EXISTING STREAM
19+00	8' LT	1' LT	7' RT	15'
19+25	11' LT	4' RT	6' RT	17'
19+50	10' LT	3' RT	7' RT	17'
CULVERT SECTION	CULVERT SECTION	CULVERT SECTION	CULVERT SECTION	17'
20+00	11' LT	2' RT	5' RT	16'
20+25	7' LT	1' LT	8' RT	15'
20+50	10' LT	4' RT	3' RT	13'
20+75	9' LT	5' RT	5' RT	14'
21+00	5' LT	1' LT	7' RT	12'
21+10	MATCH EXISTING STREAM	MATCH EXISTING THALWEG	MATCH EXISTING STREAM	MATCH EXISTING STREAM

CONSTRUCTION PLANS

PBS Engineering and Environmental Inc.
1180 NW Maple St, Ste 160
Issaquah, WA 98027
425.654.8775
pbsusa.com

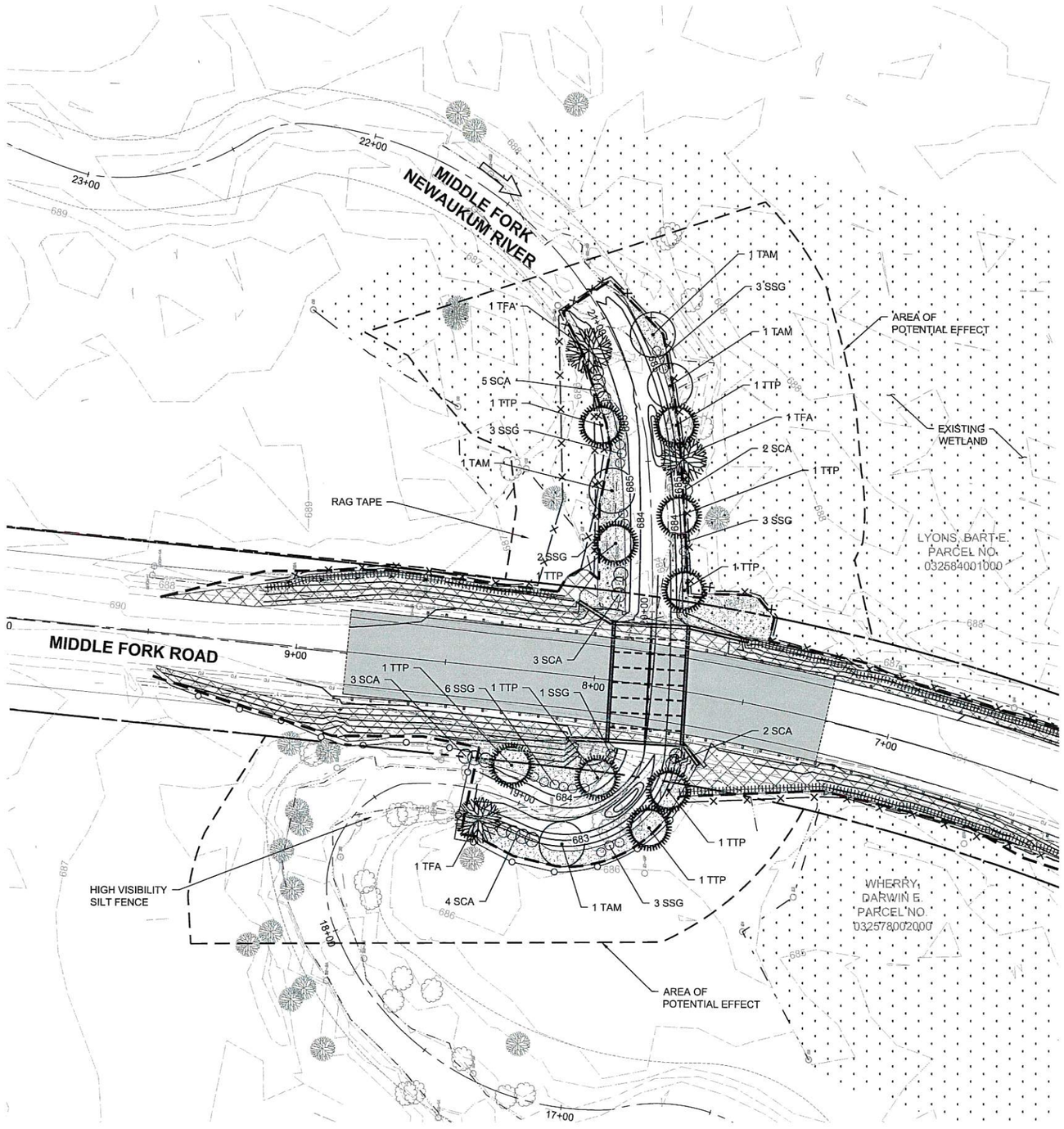
DETAILS
MIDDLE FORK RD MP 7.07 MIDDLE FORK RIVER CULVERT REPLACEMENT
SOUTH OF CENTRALIA ALPHA RD ON MIDDLE FORK RD

811 Know what's below. Call before you dig.

DAVID A. SHAMIL — STATE OF WASHINGTON — REGISTERED PROFESSIONAL ENGINEER — 39913 — 1/19/19

DESIGNED: TLF
CHECKED: DAS
JANUARY 2019
45013.000

SHEET ID
D02

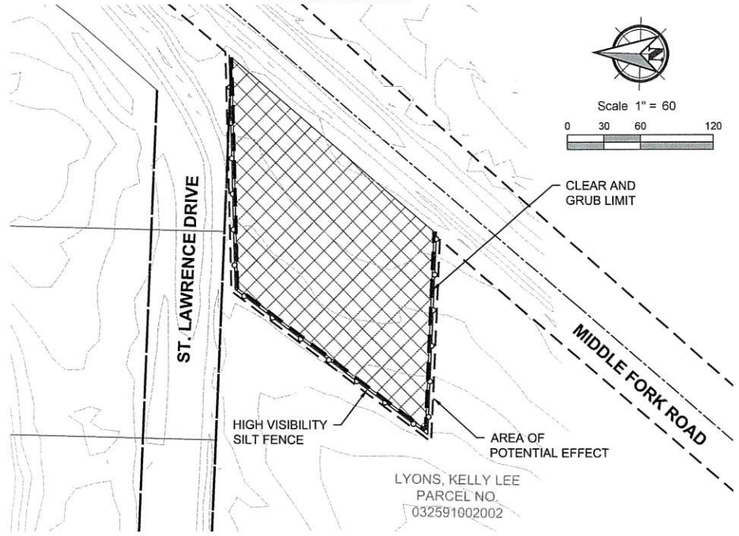


Scale 1" = 20

0 10 20 40

PLANTING MITIGATION NOTES:

1. FOR PLANT SEE SHEET P02.
2. FOR PLANTING DETAILS SEE SHEET P03.
3. DO NOT USE ANY NON-ORGANIC OR CHEMICAL FERTILIZERS WITH ANY PLANTING INSTALLATION FOR THIS PROJECT.
4. ALL EXISTING PLANT MATERIAL IS TO BE PROTECTED DURING CONSTRUCTION. ANY TREES DAMAGED DUE TO CONSTRUCTION ACTIVITIES ARE TO BE REPLACED.
5. SOIL USED FOR WETLAND MITIGATION AREAS SHALL BE THE SOIL THAT WAS CONSERVED PRIOR TO THE INSTALLATION OF TEMPORARY WETLAND ACCESS PATH.



PLANTING PLAN FOR STAGING AND STOCKPILING AREA

LEGEND:

- TTP — *THUJA PLICATA* — WESTERN RED CEDAR
- TAM — *ACER MACROPHYLLUM* — BIGLEAF MAPLE
- TFA — *FRAXINUS LATIFOLIA* — OREGON ASH
- SSG — *SALIX GEYERIANA* — GEYER WILLOW
- SCA — *CORNUS ALBA* — REDOSIER DOGWOOD
- DISTURBED AREA ABOVE THE ORDINARY HIGH WATER MARK
- DISTURBED AREA FROM GRADING AND CONSTRUCTION ACTIVITIES

CONSTRUCTION PLANS

PBS Engineering and Environmental Inc.
1180 NW Maple St. Ste 160
Issaquah, WA 98027
425.654.8775
pbsusa.com

PLANTING PLAN

MIDDLE FORK RD MP 7.07 MIDDLE FORK RIVER CULVERT REPLACEMENT

SOUTH OF CENTRALIA ALPHA RD ON MIDDLE FORK RD

Know what's below. Call before you dig.

DAVID A. SIRAN — STATE OF WASHINGTON — 39913 — REGISTERED PROFESSIONAL ENGINEER — 11/9/19

DESIGNED:	TLF
CHECKED:	DAS
	JANUARY 2019
	45013.000
SHEET ID	P01
SHEET	12 OF 14

Filename: L:\Projects\45000\45013\45013-000\000x_Middle Fork Newaukum\Civil\CAD\Working\Sheets\45013.000-L01.dwg Layout Tab: LANDSCAPE PLAN User: Taylor Ford CAD Plot Date/Time: 1/18/2019 2:12:30 PM

Full Size Sheet Format Is 22x34; If Printed Size Is Not 22x34, Then This Sheet Format Has Been Modified & Indicated Drawing Scale Is Not Accurate.

GENERAL NOTES:

1. REFER TO CIVIL ENGINEER'S DRAWINGS FOR UTILITY INFORMATION; INCLUDING STORM DRAIN, SEWER, WATER, ELECTRICAL, GAS, TELEPHONE AND CABLE.
2. REFER TO COUNTY STANDARD PLANS AND SPECIFICATIONS WHERE APPLICABLE.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY COORDINATION WITH SUBCONTRACTORS AS REQUIRED TO ACCOMPLISH ALL CONSTRUCTION OPERATIONS. ALL PIPING, CONDUIT, SLEEVES, ETC., SHALL BE SET IN PLACE PRIOR TO INSTALLATION OF IRRIGATION AND PLANTING CONSTRUCTION ITEMS.
4. CONTRACTOR SHALL BE RESPONSIBLE TO CONSULT WITH COUNTY REPRESENTATIVE, APPROPRIATE AGENCIES AND PLANS, FOR THE LOCATIONS OF ALL UNDERGROUND UTILITIES, PIPES AND STRUCTURES. CONTRACTOR SHALL TAKE SOLE RESPONSIBILITY FOR ALL DAMAGES CAUSE AS A RESULT OF THEIR WORK.
5. CONTRACTOR SHALL NOT WILLFULLY PROCEED WITH CONSTRUCTION AS DESIGNED WHEN IT IS OBVIOUS THAT OBSTRUCTIONS, AREA DISCREPANCIES AND/OR GRADE DIFFERENCE EXIST THAT MAY NOT HAVE BEEN KNOWN DURING DESIGN. SUCH CONDITIONS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE OWNER'S AUTHORIZED REPRESENTATIVE. THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR ALL NECESSARY REVISIONS DUE TO FAILURE TO GIVE SUCH NOTIFICATIONS.

PLANTING NOTES:

INSTALLATION:

1. THE CONTRACTOR SHALL INSTALL PLANTINGS ACCORDING TO THESE PLANS, DETAILS, AND THE SPECIFICATIONS.
2. VERIFY LOCATIONS OF ALL PERTINENT SITE IMPROVEMENTS UNDER OTHER SECTIONS. IF ANY PART OF THIS PLAN CANNOT BE FOLLOWED DUE TO SITE CONDITIONS, CONTACT THE OWNER'S AUTHORIZED REPRESENTATIVE FOR INSTRUCTION PRIOR TO COMMENCING WORK.
3. EXACT LOCATIONS OF PLANT MATERIALS SHALL BE REVIEWED BY THE OWNER'S AUTHORIZED REPRESENTATIVE IN THE FIELD PRIOR TO INSTALLATION. OWNER'S AUTHORIZED REPRESENTATIVE RESERVES THE RIGHT TO ADJUST PLANTS TO EXACT LOCATION IN THE FIELD.
4. ALL PLANTS SHALL BE GROWN FOR THIS REGION OR SHALL BE ADEQUATELY CLIMATIZED.
5. DO NOT MAKE SUBSTITUTIONS. IF SPECIFIED PLANTING MATERIAL IS NOT OBTAINABLE, SUBMIT PROOF OF NON-AVAILABILITY FROM AT LEAST FIVE (5) SOURCES TO THE COUNTY LANDSCAPE ARCHITECT, TOGETHER WITH THE PROPOSAL FOR USE OF EQUIVALENT MATERIAL FOR FINAL APPROVAL.
6. CONTRACTOR SHALL CONTACT THE OWNER'S REPRESENTATIVE FOR PLANT MATERIAL INSPECTION PRIOR TO INSTALLATION.
7. CONTRACTOR SHALL REPAIR OR REPLACE ANY EXISTING LANDSCAPE AFFECTED BY CONSTRUCTION TO IT'S ORIGINAL CONDITION. CONTACT LANDSCAPE ARCHITECT IF ANY AREAS NOT ORIGINALLY LANDSCAPED, BECOME LANDSCAPE.
8. ALL PLANTS SHALL BE PER WSDOT STANDARD PLAN H-10.10-00

PLANTING LIST, SPECIFICATIONS, AND DETAILS:
PLANTING LIST IS ON THIS SHEET.
FOR PLANTING DETAILS SEE SHEET L03.
FOR PLANTING SPECIFICATIONS SEE ASSOCIATED SPECIAL PROVISIONS.

TREE PROTECTION STANDARDS:

PLACING MATERIAL NEAR TREES:
NO PERSON MAY CONDUCT ANY ACTIVITY WITHIN THE PROTECTED AREA OF ANY TREE DESIGNATED TO REMAIN, INCLUDING, BUT NOT LIMITED TO, PARKING EQUIPMENT, PLACING SOLVENTS, STORING BUILDING MATERIAL AND SOIL DEPOSITS, DUMPING CONCRETE WASHOUT AND LOCATING BURN HOLES. DURING CONSTRUCTION, NO PERSON SHALL ATTACH ANY OBJECT TO ANY TREE DESIGNATED FOR PROTECTION.

PROTECTIVE BARRIER:
BEFORE DEVELOPMENT, LAND CLEARING, FILLING OR ANY LAND ALTERATION FOR WHICH A TREE REMOVAL PERMIT IS REQUIRED, THE APPLICANT SHALL:

ERECT AND MAINTAIN A READILY VISIBLE PROTECTIVE TREE FENCE ALONG THE OUTER EDGE AND COMPLETELY SURROUNDING THE PROTECTED AREA OF ALL PROTECTED TREES OR GROUPS OF TREES. FENCES SHALL BE CONSTRUCTED OF CHAIN LINK AND AT LEAST FOUR FEET HIGH, UNLESS OTHER TYPE OF FENCING IS AUTHORIZED BY THE ENGINEER.

PROHIBIT EXCAVATION OR COMPACTION OF EARTH OR OTHER POTENTIALLY DAMAGING ACTIVITIES WITHIN THE BARRIERS.

MAINTAIN THE PROTECTIVE BARRIERS IN PLACE UNTIL THE ENGINEER AUTHORIZES THEIR REMOVAL OR A FINAL CERTIFICATE OF OCCUPANCY IS ISSUED, WHICHEVER OCCURS FIRST.

ENSURE THAT ANY LANDSCAPE WORK DONE IN THE PROTECTED ZONE SUBSEQUENT TO THE REMOVAL OF THE BARRIERS SHALL BE ACCOMPLISHED WITH LIGHT MACHINERY OR HAND LABOR.

IN ADDITION TO THE ABOVE, THE ENGINEER MAY REQUIRE THE FOLLOWING:

COVER WITH MULCH TO A DEPTH OF AT LEAST 6 INCHES OR WITH PLYWOOD OR SIMILAR MATERIAL THE AREAS ADJOINING THE CRITICAL ROOT ZONE OF A TREE IN ORDER TO PROTECT ROOTS FROM DAMAGE CAUSED BY HEAVY EQUIPMENT.

MINIMIZE ROOT DAMAGE BY EXCAVATING A 2 FOOT DEEP TRENCH, AT EDGE OF CRITICAL ROOT ZONE, TO CLEANLY SEVERE THE ROOTS OF TREES TO BE RETAINED.

HAVE CORRECTIVE PRUNING PERFORMED ON PROTECTED TREES IN ORDER TO AVOID DAMAGE FROM MACHINERY OR BUILDING ACTIVITY.

MAINTAIN TREES THROUGHOUT CONSTRUCTION PERIOD BY WATERING.

GRADE:
THE GRADE SHALL NOT BE ELEVATED OR REDUCED WITHIN THE CRITICAL ROOT ZONE OF TREES TO BE PRESERVED WITHOUT THE ENGINEER'S AUTHORIZATION. THE ENGINEER MAY ALLOW COVERAGE OF UP TO ONE HALF OF THE AREA OF THE TREE'S CRITICAL ROOT ZONE WITH LIGHT SOILS (NO CLAY) TO THE MINIMUM DEPTH NECESSARY TO CARRY OUT GRADING OR PLANTING PLANS, IF IT WILL NOT IMPERIL THE SURVIVAL OF THE TREE. AERATION DEVICES MAY BE REQUIRED TO ENSURE THE TREE'S SURVIVAL.

IF THE GRADE ADJACENT TO A PRESERVED TREE IS RAISED SUCH THAT IT COULD SLOUGH OR ERODE INTO THE TREE'S CRITICAL ROOT ZONE, IT SHALL BE PERMANENTLY STABILIZED TO PREVENT SUFFOCATION OF THE ROOTS.

TREES AND OTHER VEGETATION TO BE RETAINED SHALL BE PROTECTED FROM EROSION AND SEDIMENTATION. CLEARING OPERATION SHALL BE CONDUCTED SO AS TO EXPOSE THE SMALLEST PRACTICAL AREA OF SOIL TO EROSION FOR THE LEAST POSSIBLE TIME. TO CONTROL EROSION, SHRUBS, GROUNDCOVERS AND STUMPS SHALL BE MAINTAINED ON THE INDIVIDUAL LOTS, WHERE FEASIBLE.

PLANT LIST

SYM	QTY	NAME	CONTAINER	SPACING	COMMENTS
TREES					
TAM	4	Acer macrophyllum Bigleaf Maple	36" Min. Bare Root	As Shown	Apply 3" depth of compost and bark mulch in 4' diameter ring following WSDOT Standard Plan H-10.10-100
TTP	9	Thuja plicata Western Red Cedar	5 Gallon	As Shown	Apply 3" depth of compost and bark mulch in 4' diameter ring following WSDOT Standard Plan H-10.10-100
TFA	3	Fraxinus latifolia Oregon Ash	36" Min. Bare Root	As Shown	Apply 3" depth of compost and bark mulch in 4' diameter ring following WSDOT Standard Plan H-10.10-100
STAKES					
SSG	21	Salix geyeriana Geyer Willow	36" Min. Length, 1"-2" Diam.	As Shown	
SCA	19	Cornus Alba Redosier Dogwood	Live Stake	As Shown	
ZONE B - DISTURBED AREA ABOVE ORDINARY HIGH WATER					
	1,899 SF	38.5% - *Hordeum brachyantherum* (Meadow Barley) 20% - *Bromus carinatus* (California Brome) 12% - *Festuca rubra rubra* (Native Red Fescue) 10% - *Glyceria occidentallis* (Northwestern Mannagrass) 5% - *Rosa nutkana* (Nootka Rose) 5% - *Symphoricarpos alba* (Common Snowberry) 4.5% - *Mahonia aquifolium* (Oregon Grape) 3% - *Deschampsia cespitosa* (Tufted Hairgrass) 1.5% - *Agrostis exarata* (Spike Bentgrass) 0.5% - *Holodiscus discolor* (Oceanspray)	Seed Mix	1 lbs / 1,000 SF	Place jute erosion control mat, then hydroseed the bank to ensure establishment of seed mix and erosion control. See details, sheet P03. Seed application prior to jute matting to increase seed to soil contact. Provide mix as specified, or approved equal.
ZONE C - DISTURBED AREA FROM GRADING AND CONSTRUCTION ACTIVITIES					
	5,321 SF	43% - Elymus glaucus (Blue Wildrye) 37% - *Hordeum brachyantherum* (Meadow Barley) 11% - *Lolium multiflorum* (Annual Ryegrass) 7% - *Festuca idahoensis* (Idaho Fescue) 1% - *Festuca ovina* (Sheep Fescue) 0.6% - *Deschampsia* elongata (Slender Hairgrass) 0.4% - *Koeleria macrantha* (Junegrass)	Seed Mix	1 lbs / 1,000 SF	For slopes between 2:1 and 3:1, place jute erosion control mat, then hydroseed to ensure establishment of seed mix and erosion control. For slopes less than 3:1, do not place jute erosion control matt after seeding. See details, sheet P03. Seed application prior to jute matting to increased seed to soil contact. Provide mix as specified, or approved equal.

PBS Engineering and Environmental Inc.
1180 NW Maple St, Ste 160
Issaquah, WA 98027
425.654.8775
pbsusa.com

PLANTING NOTES
MIDDLE FORK RD MP 7.07 MIDDLE FORK RIVER CULVERT REPLACEMENT
SOUTH OF CENTRALIA ALPHA RD ON MIDDLE FORK RD

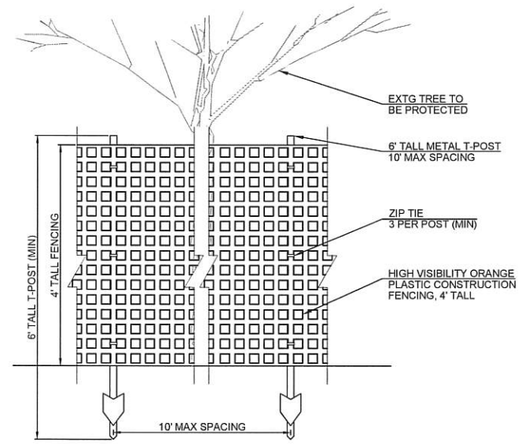
Know what's below. Call before you dig.

DAVID A. S[illegible] — STATE OF WASHINGTON — REGISTERED PROFESSIONAL ENGINEER — 1/18/19

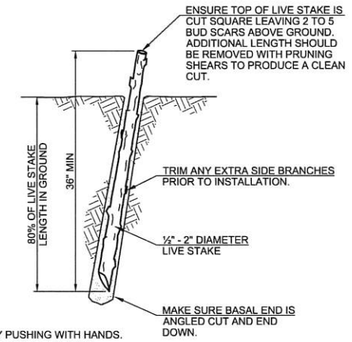
DESIGNED: TLF
CHECKED: DAS
JANUARY 2019
45013.000

SHEET ID
P02

CONSTRUCTION PLANS



1 **Tree Protection Fencing**
NOT TO SCALE



NOTE:
INSTALL LIVE STAKES BY PUSHING WITH HANDS. IF GROUND IS TOO SOLID, USE REBAR AND SLEDGE HAMMER TO MAKE HOLE PRIOR TO LIVE STAKE INSTALLATION. DO NOT HAMMER DIRECTLY ON STAKE.

2 **Live Stake Detail**
NOT TO SCALE

PBS Engineering and Environmental Inc.
1180 NW Maple St. Ste 160
Issaquah, WA 98027
425.654.8775
pbsusa.com

PBS

MIDDLE FORK RIVER CULVERT REPLACEMENT

MIDDLE FORK RD MP 7.07 MIDDLE FORK RD ON MIDDLE FORK RD

SOUTH OF CENTRALIA ALPHA RD

PLANTING DETAILS

811 Know what's below. Call before you dig.

DAVID A. SWANSON — STATE OF WASHINGTON — 39972 — REGISTERED PROFESSIONAL ENGINEER — 7/19/19

DESIGNED: TLF
CHECKED: DAS
JANUARY 2019 45013.000
SHEET ID P03
SHEET 14 OF 14

CONSTRUCTION PLANS

Full Size Sheet Format Is 22x34; If Printed Size Is Not 22x34, Then This Sheet Format Has Been Modified & Indicated Drawing Scale Is Not Accurate.

Filename: L:\Projects\45000\45013\45013-000\0004_Middle Fork Newaukum\Civil\CAD\Working\Sheets\45013.000-L01.dwg Layout Tab: LANDSCAPE DETAILS User: Taylor Ford CAD Plot Date/Time: 1/18/2019 2:12:40 PM